

# Draft CVPIA Fiscal Year 2015 Annual Work Plan, Spawning and Rearing Habitat Restoration, CVPIA Section 3406(b)(13)

## Responsible Entities:

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The U. S. Fish and Wildlife Service (USFWS) and the Bureau of Reclamation (Reclamation) jointly implement the CVPIA Program, with the California Department of Fish and Wildlife (CDFW) acting as the lead state partner. The Spawning and Rearing Habitat Restoration Program implements Section 3406 (b)(13) which directs and authorizes the Secretary of the Interior to:

*Develop and implement a continuing program for the purpose of restoring and replenishing, as needed, spawning gravel lost due to the construction and operation of Central Valley Project dams, bank protection projects, and other actions that have reduced the availability of spawning gravel and rearing habitat in the Upper Sacramento River from Keswick Dam to Red Bluff Diversion Dam in the American and Stanislaus Rivers downstream from the Nimbus and Goodwin Dams, respectively. The program shall include preventive measures, such as re-establishment of meander belts and limitations on future bank protection activities, in order to avoid further losses of instream and riparian habitat. Costs associated with implementation of this paragraph shall be reimbursed in accordance with the following formula: 37.5 percent shall be reimbursed as main project features, 37.5 percent shall be considered a nonreimbursable Federal expenditure, and 25 percent shall be paid by the State of California.*

## **Background:**

In a free flowing river rocks, gravel, dirt, and other materials are continually moving downstream providing diverse habitats for successful salmonid spawning and juvenile rearing. The construction of dams has had a dramatic effect on streams by impeding this process. Below the dams coarse sediment continues to be transported downstream by the flowing water without it being replaced by upstream sources. Section 3406(b)(13) was included in the CVPIA to provide for a continuing program for replacing, as needed, this material blocked by the dams along with the associated habitat values. Sediment deficits have been estimated for the project rivers. This program seeks to replace a portion of the gravel deficits with a focus on sites where the greatest habitat values can be achieved. Spawning gravel is most limited and adult fish are usually most abundant in upstream reaches below the dams so the program has focused on those areas first. The program is now implementing projects that incorporate both spawning and rearing habitat features to address the freshwater lifestages of salmonids.

## **Program Goals and Objectives for FY 2015:**

The major program performance goals as stated in CPAR and other documents are as follows:

- Increase the availability of spawning and rearing habitat for Sacramento River Basin Chinook salmon and steelhead trout by placing 10,000 tons of gravel. Support at least 25% of riverwide spawning salmonids in gravel placement reaches.
- Increase the availability of spawning and rearing habitat for American River Basin Chinook salmon and steelhead trout by placing 7,000 tons of gravel. Support at least 25% of riverwide spawning salmonids on gravel placement projects. Less than 10% egg retention in Chinook salmon.
- Increase the availability of spawning and rearing habitat for Stanislaus River Basin Chinook salmon and steelhead trout by placing 3,000 tons of gravel and meet the NMFS OCAP RPA Action prescribing 50,000 cubic yards (75,000 tons) of gravel placed by 2014. Support at least 10% of riverwide spawning salmonids on gravel placement projects.
- The program is increasingly emphasizing restoration of side channels, channel margins, meander belts, and complexity to address the current potentially limited amount of juvenile rearing habitat, particularly in dryer years. Restoration of these habitats is being incorporated into the program as overall CVPIA Fisheries Program priorities are refined.

To achieve these goals the program strives to implement a spawning and rearing habitat restoration project in each of the project rivers each year and to conduct monitoring to assess the effectiveness of the projects at meeting project goals.

Work performed in this program compliments the objectives in CVPIA Section 3406(b)(1). Staff involved in the two programs coordinate the development of the activities in the respective watersheds and share the data developed from this work.

## **Status of the Program:**

Project sites in each of the three rivers have been identified based on fish presence, existing habitat availability and river access. Aspects specific to each river are described below.

### **Sacramento River**

In recent years (2002 to 2014), gravel has been placed at two sites in the Upper Sacramento River – (1) at the USBR Keswick Office injection site, on the right bank 300 yards downriver from Keswick Dam, and (2) at the Salt Creek injection site- 1.5 miles downriver from Keswick Dam. Both sites are within Redding city limits. The gravel is placed on the edge of the channel and high flows distribute the gravel within the river channel to be subsequently utilized for spawning and rearing. Since 1997, the CVPIA program has placed approximately 220,000 tons of gravel at these two sites (including the FY14 estimated placement of 15,000 tons). Examination of CDFW aerial redd survey data since the 1960's and instream gravel locations show that Chinook salmon are preferentially using injected gravel that was placed at the Keswick Dam and Salt Creek sites. Recent substrate/particle size, intergravel permeability and water quality survey data showed that spawning gravel quality was the highest upstream of the ACID dam area, where the greatest amount of gravel augmentation has taken place (North State Resources June 2012). The report also noted that gravels in areas downstream of ACID dam were typically coarser and displayed channel bed armoring.

Seven project sites in the 14 mile reach below Keswick Dam are currently undergoing permitting. Proposed activities at these sites include side channel habitat creation, woody material additions, and gravel placement. One of these sites will be selected for implementation in 2015.

### **American River**

Gravel in the American River and Stanislaus River has been placed to create habitat features anticipated to be immediately usable by salmonids. Gravel has been placed at six sites in the American River in 1999 and 2008 - 2012 - three locations at Sailor Bar, two locations at upper Sunrise, downstream of Lower

Sunrise Bridge, and at Sacramento Bar. The substrate at the sites was manipulated prior to gravel placement in order to improve water quality conditions within the gravel (the area where eggs develop) after the gravel was in place. The conditions in the regions where gravel was placed has been monitored and compared with pre-project conditions and to conditions in adjacent areas. A series of gravel and side channel projects began implementation in 2008. Reclamation contracted with the Water Forum (City of Sacramento) for assistance in the permitting, placement, and monitoring of projects. Gravel placements through 2013 totaled 91,000 tons. Work has occurred at eight of the sites (six main channel and four side channel sites) identified in the initial planning document. The program is finalizing a planning framework using a Structured Decision Making process to help guide American River project selection, design, and monitoring. A data repository is being developed to house documents and data relevant to the projects.

### **Stanislaus River**

Several sites have been selected for gravel placement in the Stanislaus River in the reach within two miles downriver of Goodwin Dam and at Knights Ferry. Gravel has been placed by conventional front end loader, by sluice delivery, and by helicopter since 1997. Approximately 30,000 tons of gravel has been placed to date. The program is currently working on implementation of a channel enhancement project at Two Mile Bar where a side channel will be created through a high floodplain and the adjacent floodplain area lowered. Suitable material from the floodplain will be sorted to obtain the spawning sized material and that material placed into the river in the project area. The goal of the project is to provide juvenile rearing habitat year round, increased floodplain inundation during higher flows and additional gravel to the river. This will help to meet the NMFS RPA actions prescribing increased spawning gravel injections and enhanced floodplain rearing habitat, specifically for steelhead.

### **Overall**

Salmonids have been observed spawning on the placed gravel in each river. Aerial and ground surveys have documented the location of salmon and steelhead redds and determined that juvenile salmonid rearing occurs at and in the vicinity of the gravel and side channel projects. Intragravel conditions have been monitored for selected gravel placement projects and shown that gravel placement has provided high quality conditions for salmonid egg incubation. Increased utilization of floodplain rearing habitat provided through gravel placement has been documented through monitoring.

Gravel projects have traditionally focused primarily on spawning habitat due to the gravel deficit that is present below most dams. The recognition that rearing habitat conditions in the lower rivers and delta are particularly degraded and emigration survival is low has resulted in an increased attempt to design both spawning and rearing habitat features into projects. It is anticipated that with

increased rearing habitat in close proximity to spawning areas higher numbers of juvenile Chinook salmon will remain to rear and grow larger in these areas. Larger juveniles obtain higher survival rates during emigration to the ocean. Juvenile steelhead rearing habitat is expected to be enhanced by providing more habitat complexity in these areas where steelhead are present year round and water is coolest during summer. Features such as incorporation of side channel habitat, inundated floodplain habitat, inclusion of woody material, rock piles, boulders, and island creation have been included in recently constructed projects and are providing increased rearing habitat to increase carrying capacity for juvenile salmonids in the project rivers.